Isom, Debra A (Debbi)

From: Huckaby, Alisa [AHUC461@ECY.WA.GOV]
Sent: Monday, May 14, 2001 1:58 PM
To: 'Debra_A_Debbi_Isom@RL.gov'
Cc: 'Glenn_Richardson@rl.gov'; 'Kevin_D_Leary@rl.gov'; 'Roger_W_Szelmeczka@RL.gov'; 'Jamie_G_Granger@rl.gov'; Jamison, Fred; Caggiano, Joseph; Huckaby, Alisa
Subject: FW: Information on the LERF Leachate Collection System

Debbi,

Ecology hopes to modify the RCRA permit for the Liquid Effluent Retention Facility (LERF) within the next 15 months. DOE and Contractors provided information that I would like to have placed on the administrative record. During a monthly project management meeting, I took an action item to request the below information be placed on the administrative record in support of the upcoming permit modification. Would you please place these electronic mail messages and attached files on the LERF administrative record? If you have any questions or would like to discuss, please call me at 736-3034. In advance, thank you for your assistance.

Alisa Huckaby
Washington State Department of Ecology
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FAX 736-3030

> -----Original Message-----
> From: Kevin_D_Leary@RL.gov [mailto:Kevin_D_Leary@RL.gov]
> Sent: Thursday, March 08, 2001 2:44 PM
> To: Conaway, Kathy; Jamison, Fred; Caggiano, Joseph; Huckaby, Alisa
> Cc: john.fruchter@pnl.gov; Marvin_J_Furman@rl.gov
> Subject: RE: Information on the LERF Leachate Collection System
>
> Attached is some additional information I thought you might find useful.
> If you require any additional information, don't hesitate in contacting
> either myself or Glenn Richardson
> -----Original Message-----
> From: Szelmeczka, Roger W
> Sent: Thursday, March 08, 2001 8:36 AM
> To: Leary, Kevin D
> Cc: Richardson, Glenn
> Subject:
>
> Kevin,
> Per our telecon, below is the information on the LERF sump construction
> and operation. Let me know if you are looking for more information
> relevant to LERF.
> Roger
> 4.5.6 Double Liner and Leak Detection, Collection, and Removal System
> [806(4)(d)(ii)(D) and 650(2)(j)(iii)]
> The double-liner system for LERF is discussed in Section 4.5.2
> <http://www.hanford.gov/docs/rl-97-03/>. The leachate detection,
> collection, and removal system (Figures 4-17
> <http://www.hanford.gov/docs/rl-97-03/rl97-03chap04fig.html> and 4-18
> <http://www.hanford.gov/docs/rl-97-03/rl97-03chap04fig.html>) was designed
> and constructed to remove leachate that might permeate the primary liner.
> System components for each basin include:
> * 30.5-centimeter layer of drainage gravel below the primary liner at
> the bottom of the basin
> * Geonet below the primary liner on the sidewalls to direct leachate
> to the gravel layer
> * 3.0-meter by 1.8-meter by 0.30-meter-deep leachate collection sump
> consisting of a 25 millimeter high-density polyethylene flat stock,

> geotextile to trap large particles in the leachate, and 1.5-millimeter
> high-density polyethylene rub sheet set on the secondary liner
> * 10-inch and 4-inch perforated leachate high-density polyethylene
> riser pipes from the leachate collection sump to the catch basin northwest
> of the basin
> * Leachate collection sump level instrumentation installed in the
> 4-inch riser
> * Level sensors, submersible leachate pump, and 1.5-inch
> fiberglass-reinforced epoxy thermoset resin pressure piping installed in
> the 10-inch riser
> * Piping at the catch basin to route the leachate through 1.5-inch
> high-density polyethylene pipe back to the basins.
> The bottom of the basins have a 2 percent slope to allow gravity flow of
> leachate to the leachate collection sump. This exceeds the minimum of 1
> percent slope required by WAC 173-303-650(j) for new surface impoundments.
> Material specifications for the leachate collection system are given in
> Section 4.5.2.1.1 <http://www.hanford.gov/docs/rl-97-03/>.
> Calculations demonstrate that fluid from a small hole (2 millimeter) (EPA
> 1989, p. 122) at the furthest end of the basin, under a low head
> situation, would travel to the sump in less than 24 hours (HNF 1997).
> Additional calculations in indicate the capacity of the pump to remove
> leachate is sufficient to allow time to readily identify a leak and
> activate emergency procedures (HNF 1997).
> Automated controls maintain the fluid level in each leachate sump below 33
> centimeters to prevent significant liquid backup into the drainage layer.
> The leachate pump is activated when the liquid level in the sump reaches
> about 28 centimeters, and is shut off when the sump liquid level reaches
> about 18 centimeters. This operation prevents the leachate pump from
> cycling with no fluid, which could damage the pump. Liquid level control
> is accomplished with conductivity probes that trigger relays selected
> specifically for application to submersible pumps and leachate fluids. A
> flowmeter/totalizer on the leachate return pipe measures fluid volumes
> pumped and pumping rate from the leachate collection sumps, and indicates
> volume and flow rate on local readouts. Other instrumentation provided is
> real-time continuous level monitoring with a readout at the catch basin
> and the 242-A Evaporator control room. A sampling port is provided in the
> leachate piping system at the catch basin. Leak detection is provided
> through inspections of the leachate flow totalizer readings. For more
> information on inspections, refer to Chapter 6.0
> <http://www.hanford.gov/docs/rl-97-03/rl97-03chap06.html>.
> The stainless steel leachate pump is designed to deliver 110 liters per
> minute. The leachate pump returns draws liquid from the sump via 1.5-inch
> pipe and discharges into the basin through 1.5-inch high-density
> polyethylene pipe.
> Drainage Gravel. The drainage layer consists of thoroughly washed and
> screened, naturally occurring rock meeting the size specifications for
> Grading Number 5 in Washington State Department of Transportation
> construction specifications (WSDOT 1988). The specifications for the
> drainage layer are given in Table 4-5
> <http://www.hanford.gov/docs/rl-97-03/rl97-03chap04_tbls.html>. Hydraulic
> conductivity tests (Chen-Northern 1992a, 1992b, 1992c) showed the drainage
> rock used at LERF met the sieve requirements and had a hydraulic
> conductivity of at least 1 centimeter per second, which exceeded the
> minimum of at least 0.1 centimeters per second required by WAC
> 173-303-650(2)(j) for new surface impoundments.